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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,548	10/24/2003	Lianjun Liu	SC11645ZP P01	1109

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EXAMINER	
ROJAS, BERNARD	

ART UNIT	PAPER NUMBER
2832	

DATE MAILED: 02/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/692,548	LIU ET AL.	
	Examiner	Art Unit	
	Bernard Rojas	2832	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7-11,13,17,18 and 20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-11,13,17,18 and 20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments, filed 12/01/05, with respect to the rejection(s) of claim(s) pending claims have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Cowen et al. [US 6,229,684], that teaches forming a low temperature dielectric material deposited by plasma enhanced chemical vapor deposition (PECVD) at a temperature below 300 degrees Celsius [col. 10 line 50 to col. 12 line 11].

Claim Rejections - 35 USC § 103

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 7, 9-11, 13, 17, 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu et al. [US 6,768,403] in view of Lin et al. [US 6,818,936] and in further view of Cowen et al. [US 6,229,684].

Claims 1, 3 and 4, Hsu et al. discloses a method of making a device comprising the steps of: providing a substrate [14]; forming a first conductive layer [18, 20, 22 and 34] over the substrate [figure 4A]; forming a sacrificial layer [46] over the first conductive layer [figure 4B]; forming a dielectric layer [26] over the sacrificial layer, forming a second conductive layer [30] over the sacrificial [figure 4E]; and removing the sacrificial layer [figure 4F].

Hsu et al. fails to disclose that the dielectric layer comprises silicon, oxygen, and nitrogen and is formed by PECVD.

Lin et al. teaches that a common dielectric material in the art is silicon oxynitride that is formed by plasma enhanced chemical vapor deposition (PECVD) [col. 6 lines 1-34].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a silicon oxynitride dielectric material instead of the silicon nitride or silicon oxide discloses by Hsu et al. since it was known in the art as a dielectric material [Lin et al. col. 6 lines 1-34].

Hsu et al. in view of Lin et al. fails to disclose that forming the dielectric layer is performed at a temperature between approximately 200 and 300 degrees Celsius.

Cowen et al.

Cowen et al. teaches forming a low temperature dielectric material deposited by plasma enhanced chemical vapor deposition (PECVD) at a temperature below 300 degrees Celsius [col. 10 line 50 to col. 12 line 11].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a temperature below 300 degrees Celsius when forming the device as discloses by Hsu et al. in view of Lin et al. in order to prevent damage to the HTS material in the device [Cowen et al., col. 10 line 50 to col. 12 line 11].

Claim 2, Hsu et al. discloses the method of claim 1, wherein the forming the sacrificial layer comprises forming a polyimide layer [col. 7 lines 40-45, 59-63].

Claims 7, 13 and 20, Cowen et al. discloses that PECVD is performed at about 250 degress Celsius [col. 10 line 50 to col. 12 line 11]. Hsu et al. in view of Lin et al and in further view of Cowen et al. fails to each that PECVD is performed at 240 degrees Celsius. It would have been obvious to one having ordinary skill in the art at the time the invention was made to perform PECVD at a temperature of approximately 240 degrees Celsius, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 9-11, Hsu et al. discloses a method of making a microelectronic device comprising the steps of: providing a substrate [14]; forming an input signal line [18] over the substrate; forming an output signal line [20] over the substrate and spaced apart from the input signal line [figure 4A]; forming a sacrificial layer [46] over the input signal line and the output signal line [figure 4B]; forming a dielectric layer[26] over the

sacrificial layer [figure 4C]; removing the sacrificial layer [figure 4F]; and forming a conductive layer [30] over the dielectric layer.

Hsu et al. fails to discloses that the dielectric layer comprises silicon, oxygen, and nitrogen and is formed by PECVD.

Lin et al. teaches that a common dielectric material in the art is silicon oxynitride that is formed by plasma enhanced chemical vapor deposition (PECVD) [col. 6 lines 1-34].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a silicon oxynitride dielectric material instead of the silicon nitride or silicon oxide discloses by Hsu et al. since it was known in the art as a dielectric material [Lin et al. col. 6 lines 1-34].

Hsu et al. in view of Lin et al. fails to disclose that forming the dielectric layer is performed at a temperature between approximately 200 and 300 degrees Celsius.

Cowen et al.

Cowen et al. teaches forming a low temperature dielectric material deposited by plasma enhanced chemical vapor deposition (PECVD) at a temperature below 300 degrees Celsius [col. 10 line 50 to col. 12 line 11].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a temperature below 300 degrees Celsius when forming the device as discloses by Hsu et al. in view of Lin et al. in order to prevent damage to the HTS material in the device [Cowen et al., col. 10 line 50 to col. 12 line 11].

Claims 17 and 18, Hsu et al. discloses a method of making a device comprising the steps of: providing a substrate [14]; forming a first conductive layer [18, 20, 22 and 34] over the substrate [figure 4A]; forming a sacrificial layer [46] over the first conductive layer [figure 4B]; forming a dielectric layer [26] over the sacrificial layer [figure 4C]; forming a second conductive layer [30] over the sacrificial layer [figure 4E]; and removing the sacrificial layer [figure 4F].

Hsu et al. fails to discloses that the dielectric layer comprises silicon, oxygen, and nitrogen and is formed by PECVD.

Lin et al. teaches that a common dielectric material in the art is silicon oxynitride that is formed by plasma enhanced chemical vapor deposition (PECVD) [col. 6 lines 1-34].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a silicon oxynitride dielectric material instead of the silicon nitride or silicon oxide discloses by Hsu et al. since it was known in the art as a dielectric material [Lin et al. col. 6 lines 1-34].

Hsu et al. in view of Lin et al. fails to disclose that forming the dielectric layer is performed at a temperature between approximately 200 and 300 degrees Celsius.

Cowen et al.

Cowen et al. teaches forming a low temperature dielectric material deposited by plasma enhanced chemical vapor deposition (PECVD) at a temperature below 300 degrees Celsius [col. 10 line 50 to col. 12 line 11].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a temperature below 300 degrees Celsius when forming the device as discloses by Hsu et al. in view of Lin et al. in order to prevent damage to the HTS material in the device [Cowen et al., col. 10 line 50 to col. 12 line 11].

Claims 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu et al. [US 6,768,403] in view of Lin et al. [US 6,818,936], in view of Cowen et al. [US 6,229,684] and in further view of Murakami et al.

Claims 5 and 8, Hsu et al. in view of Lin et al., and in further view of Cowen et al. discloses the claimed method of making a device with the exception that the dielectric layer comprises silicon, oxygen, nitrogen and hydrogen that are formed by PECVD.

Murakami et al. teaches forming a silicon oxynitride dielectric film comprising N2O; N2; NH3; and SiH4 by plasma CVD [paragraph 87].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a silicon oxynitride dielectric material instead of the silicon nitride or silicon oxide discloses by Hsu et al. since it was known in the art as a dielectric material [as taught by Lin et al. col. 6 lines 1-34].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Rojas whose telephone number is (571) 272-1998. The examiner can normally be reached on M-F 8-4:00), every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin G. Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Bernard Rojas
BR

SPE- AU 2832
02/03/06